

STATEMENT OF BASIS

American Foam Cast, Inc.
Sylacauga, AL
Talladega County
309-0044

The proposed renewal to the Title V Major Source Operating Permit (MSOP) is issued under the provisions of ADEM Admin. Code r. 335-3-16. The above-referenced applicant has applied to renew the existing Title V Permit, which was last issued on October 6, 2015. The applicant has requested authorization to perform the work or to operate the facility shown on the application, drawings, plans, and other documents, which were submitted on April 1, 2020, and are attached hereto or on file with the Air Division of the Alabama Department of Environmental Management, in accordance with the terms and conditions of this permit.

Per ADEM Rule 335-3-16-.12(2), an application for permit renewal shall be submitted at least six (6) months, but not more than eighteen (18) months, before the date of expiration of the permit. Based on this rule, the application for renewal was due to the Department no later than April 6, 2020, but no earlier than April 6, 2019. An application for permit renewal was received by the Department on April 1, 2020. Based on this the Department considers this to be a timely application.

American Foam Cast, Inc. (AFC) located in Sylacauga, Alabama operates a lost foam aluminum foundry. The facility produces aluminum alloy castings for the automotive, marine, and heavy truck industries. Based on the Title V permit application, this facility is a potential major source for Particulate Matter (PM) and Hazardous Air Pollutants (HAPs), particularly Styrene and Ethyl-Benzene from the facility operations.

The facility is subject the National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters found in 40 CFR Part 63, Subpart DDDDD. Several sources at the facility are also subject to Compliance Assurance Monitoring (CAM) for particulate matter. American Foam Cast has stated in the renewal application that there are no significant changes to any process at the facility.

The following are significant sources of air pollution for this facility:

1. Foam Pattern Making Process
2. Two Aluminum Melting Furnaces (EP002)
3. EPS Molding and Casting Unit with shared Baghouse (EP001)
4. Three Shotblast Machines with shared Baghouse (EP001)
5. Thermal Reclamation Unit with shared Baghouse (EP001)
6. Boiler System (EP003)

Facility Wide Emissions PTE

Pollutant	Potential Emissions	Major
*PM	183.15	Y
CO	0.6	N
NO _x	3.0	N
SO ₂	0.1	N
VOC	0.2	N
Styrene	98	Y
Ethyl-Benzene	19.7	Y
Pentane	9.5	N
X-Methyl Benzene	0.15	N
Benzene	0.83	N
Cumene	0.93	N
Toluene	6.5	N

*Includes PM₁₀ and PM_{2.5}

Renewal Notes/Notable Changes:

1. AFC performed the one-time *Energy Assessment* for the existing boiler as required by 40 CFR Part 60, Subpart DDDDD, Table 3, in January 2016. Therefore, provisos 1 & 2 from the Emission Monitoring section for the Boiler System from previous Title V permit have been removed.
2. Rule 335-3-4-.03 "*Control of Particulate Emissions – Fuel Burning Equipment*" and Rule 335-3-5-.01 "*Control of Sulfur Compound Emissions – Fuel Combustion*", were added to the Applicability and Emission Standards sections of the Boiler System provisos.

Foam Pattern Making Process

Process Description:

Plastic beads containing six percent pentane are partially expanded by conveying them through a steam heated unit. Pentane amounting to five percent of the weight of the bead is driven off in the process. The expanded bead is further expanded by steam in the EPS pattern molding machine. The polystyrene is dried in an electric heated aging oven, which releases the remaining two percent of pentane. The patterns are then assembled by glue to sprues into clusters. The aged clusters are next dip coated with based refractory slurry. Following drying of the refractory coating, the pattern cluster is ready for the aluminum casting operation.

Emission points “A” and “B” are associated with this process but are considered fugitive and are therefore referenced as emission point “FUG” in the permit.

Applicability:

This source is subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.

Emissions Standards:

The only emissions from this process are fugitive.

Expected Emissions:

The following **pentane** emissions are based material balance calculations and 8,760 hours of operation per year.

Emission Point	Expected Emissions	
	lb/hr	TPY
A	2.9	12.47
B	1.4	6.02

Compliance and Performance Test Methods and Procedures:

This source is subject to no additional specific requirements other than those listed in the General Provisos.

Emission Monitoring:

This source is subject to no additional specific requirements other than those listed in the General Provisos.

Recordkeeping and Reporting Requirements:

This source is subject to no additional specific requirements other than those listed in the General Provisos.

Compliance Assurance Monitoring (CAM):

This subpart is applicable to an emission source provided the source meets the following criteria: it is subject to an emission limit or standard, it uses a control device to achieve compliance with the emissions limit or standard, and it has pre-controlled emissions from a regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source [40 CFR 64.2(a)]. This units do not use a control device to achieve compliance; therefore, Compliance Assurance Monitoring (CAM) does not apply.

Aluminum Melting Furnaces

Project Description:

Aluminum alloy ingots and foundry re-melt are placed on the hearth of either of the two furnaces via a front end loader. The charge materials are heated by combustion of natural gas to 1450 – 1500 °F in one of the two furnaces rated at 7.5 MMBtu/hr total. Melted aluminum flows to the opposite end of the furnace where it is collected in a well. The molten aluminum is maintained at the desired process temperature, degassed, and then poured into flasks formed from trees of polystyrene patterned replicas being in cased by mullite grain. The molten aluminum burns and vaporizes the polystyrene replica leaving a cavity to fill thus forming the desired cast aluminum part.

Emission Point (EP002) is associated with this process.

Applicability:

This source is subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.

This source is subject to ADEM Admin. Code r. 335-3-4-.01(1), “*Control of Particulate Emissions – Visible Emissions*”.

This source is subject to ADEM Admin. Code r. 335-3-4-.04(1), “*Control of Particulate Emissions for Process Industries – General*”.

This source has an enforceable limit in order to prevent them from being subject to the provisions of ADEM Admin. Code r. 335-3-14-.04, “*Air Permits Authorizing Construction in Clean Air Areas [Prevention of Significant Deterioration]*”.

Only clean metal such as “pigs”, foundry returns, and similar types of clean aluminum shall be charged or melted in the furnaces. (*Rule 335-3-16-.04*)

This source is **not** subject to the applicable requirements of 40 CFR 63 Subpart RRR, “*National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production*” since the facility is classified as a foundry and only melts clean charge and do not operate sweat furnaces, thermal chip dryers, or scrap dryers/delacquering kilns/decoating kilns per §63.1503.

This source is **not** subject to the applicable requirement of 40 CFR 63 Subpart ZZZZZZ, “*National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Aluminum, Copper, and Other Nonferrous Foundries*” since the facility is classified as a major source of HAPs.

Emissions Standards:

Opacity

ADEM Admin Code r. 335-4-.01(1)(a)-(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty percent (20%) opacity, as determined by a six (6) minute average. During one six (6) minute period a person may discharge into the atmosphere from any source of emission forty percent (40%) opacity.

Rule 335-3-4-.01

Particulate Matter

Particulate matter emissions from the stack associated with the two aluminum melt furnaces shall not exceed the lesser of the Anti-PSD limit of 3.47 lbs/hr as required by ADEM Admin Code r. 335-3-14-.04.

OR

the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62}$$

(P < 30 tons per hour)

$$E = 17.31 (P)^{0.16}$$

(P ≥ 30 tons per hour)

Where:

E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

Expected Emissions:

Emission calculations are based on <7,488 hours of operation per year. Emissions are based on an annual usage of 4.2×10^6 SCF of natural gas used in 2007 (best production year) and AP-42 Emission Factors from Table 1.4-1 and 1.4-2.

Pollutant	Expected Emissions		Emission Limit	
	lb/hr	TPY	lb/hr	TPY
PM	0.0027	0.012	3.47	14.92
SO ₂	0.0023	0.010		
VOC	0.0027	0.012		
CO	0.001	0.046		
NO _x (Fugitive)	0.053	0.231		

Compliance and Performance Test Methods and Procedures:

Method 5 of 40 CFR 60, Appendix A, Shall be used in the determination of particulate matter emissions. (*Rule 335-3-1-.05*)

Method 5 of 40 CFR 60, Appendix A, Shall be used in the determination of opacity. (*Rule 335-3-1-.05*)

Emission Monitoring:

This source is subject to no additional specific requirements other than those listed in the General Provisos.

Recordkeeping and Reporting Requirements:

This source is subject to no additional specific requirements other than those listed in the General Provisos.

Compliance Assurance Monitoring (CAM):

This subpart is applicable to an emission source provided the source meets the following criteria: it is subject to an emission limit or standard, it uses a control device to achieve compliance with the emissions limit or standard, and it has pre-controlled emissions from a regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source [40 CFR 64.2(a)]. This units do not use a control device to achieve compliance; therefore, Compliance Assurance Monitoring (CAM) does not apply.

EPS Molding and Casting Unit with shared Baghouse

Process Description:

AFC produces aluminum alloy castings using the lost foam casting process. Each part is produced from a polystyrene foam replica. The foam replica is assembled into clusters by gluing them to styrene trees. The assembly is then coated with fine refractory slurry, dried, then embedded in un-bonded mullite grain and cast with aluminum alloy. The heat in the molten metal melts and/or vaporizes the foam forming a cavity which is displaced by molten metal. Upon solidification, the alloy freezes in the shape of the styrene pattern in the form of the desired part. After solidification and cooling, the tree of parts is removed from the processing flask. The mullite grain is cooled and returned to the sand system for recycling. The castings are cut off the tree and cleaned by shotblast machines, finished, inspected, and packed for shipment.

Emission Points “1” and “2” are associated with this process. Emissions from Emission point “2” are attributed from the aluminum pouring process. The EPS Molding and Casting Unit shares a common baghouse with the three (3) Shotblast Machines and the Thermal Reclamation Unit.

Applicability:

This process is subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.

This process is subject to ADEM Admin. Code r. 335-3-4-.01(1), “*Control of Particulate Emissions – Visible Emissions*”.

This process is subject to ADEM Admin. Code r. 335-3-4-.04(1), “*Control of Particulate Emissions for Process Industries – General*”.

This process has an enforceable limit in order to prevent them from being subject to the provisions of ADEM Admin. Code r. 335-3-14-.04, “*Air Permits Authorizing Construction in Clean Air Areas [Prevention of Significant Deterioration]*”.

This process is subject to 40 CFR 64, “*Compliance Assurance Monitoring*” (CAM).

There are no New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAP) applicable to this process.

Emissions Standards:

Opacity

ADEM Admin Code r. 335-4-.01(1)(a)-(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty percent (20%) opacity, as

determined by a six (6) minute average. During one six (6) minute period a person may discharge into the atmosphere from any source of emission forty percent (40%) opacity.

Per CAM analysis, the Baghouse shall maintain an opacity reading less than five percent (5%) but not exceed ten percent (10%) for more than four (4) hours. (40 CFR Part 64 – CAM)

Particulate Matter

Particulate matter emissions from the EPS Casting/Molding unit shall not exceed the lesser of the Anti-PSD limit of 23.78 lbs/hr (57.07 TPY) as required by ADEM Admin Code r. 335-3-14-.04, or the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62}$$

(P < 30 tons per hour)

$$E = 17.31 (P)^{0.16}$$

(P ≥ 30 tons per hour)

Where:

E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

CAM Analysis:

The Anti-PSD limit of 23.78 lbs/hr would exceed 100 TPY based on 8,760 hours of operation per year for this unit. Given that this limit is set for post-control emissions and given a control efficiency of 99%, it is assumed that this unit would be subject to CAM based on pre-control emissions. In addition to the Anti-PSD limit, AFC has requested to limit the hours of operation to 4,800 hours in any consecutive twelve month period. The limit to hours of operation in conjunction with the effect of the control device would reduce is PM emissions below the 100 TPY threshold based on the potential to emit, as defined by §64.1. This would prevent the facility from being required to collect four or more data values as required in §64.3(b)(4)(ii).

Refer to the section labeled “Compliance Assurance Monitoring Plan” to see AFC’s monitoring plan to ensure limits are met.

Compliance and Performance Test Methods and Procedures:

Method 5 of 40 CFR 60, Appendix A, Shall be used in the determination of particulate matter emissions. (Rule 335-3-1-.05)

Method 5 of 40 CFR 60, Appendix A, Shall be used in the determination of opacity. (*Rule 335-3-1-.05*)

Emission Monitoring:

- The facility shall perform a visual check, once per day, of the stack associated with this unit. This check shall be performed by a person familiar with Method 9. If the instantaneous opacity of emissions in excess of 10% are noted, and are not corrected within a period of 1 hour, then a Method 9 must be performed within 4 hours of the observations. Maintenance shall be performed as needed. Any repairs or observed problems shall be recorded. (*40 CFR Part 64 – CAM*)
- The facility shall monitor and record the baghouse pressure differential daily. Any deviations from the pressure range of 2.0 inches of H₂O to 7.0 inches of H₂O shall be documented along with the corrective action taken and reported to the Department within two (2) working days. (*40 CFR Part 64 – CAM*)
- The facility shall calibrate the pressure gauge annually. If an erratic or abnormal reading is observed then the instrument shall be inspected and either calibrated or replaced. (*40 CFR Part 64 – CAM*)
- The facility shall conduct an annual inspection of the complete baghouse unit. This shall include:
 - Baghouse structure, access doors, door seals, and bags
 - An internal inspection of the baghouse hoppers

(*40 CFR Part 64 – CAM*)

- The facility shall conduct the following weekly inspections:
 - Check hopper, fan, and cleaning cycle for proper operation
 - Perform a visual check of all hoods and ductwork

(*Rule 335-3-16-.05*)

Recordkeeping and Reporting Requirements:

- The facility shall maintain a record of all inspections, to include visible observations and Method 9 observations performed to satisfy the requirements of periodic monitoring. This shall include all problems observed and corrective actions taken. Each record shall be maintained for a period of 5 years. (*Rule 335-3-16-.05(c)(3)*)
- If a visible emission observation required using the 40 CFR, Part 60, Appendix A, Method 9, the results should be documented using an ADEM visible emissions observation report and the cause and corrective action taken will be documented in a form suitable for inspection.

- The facility shall maintain daily records the baghouse differential pressure. Each record shall be maintained for a period of 5 years. (40 CFR Part 64 – CAM)
- Records of monthly and rolling 12-month total of hours of operation shall be recorded in a form suitable for inspection and these records shall be maintained for a minimum of 5 years. (Rule 335-3-16-.05(c)(3))

Expected Emissions:

The following emission estimates are based on a stack test analysis from 1996 and 4,800 hrs of operation per year according to CAM.

Emission Point	Pollutant	Expected Emissions		Emission Limit	
		lb/hr	TPY	lb/hr	TPY
1	PM	23.78	57.1	23.78	57.1
	Styrene	21.87	52.49		
	Benzene	0.12	0.29		
	Toluene	1.19	2.86		
	Ethyl Benzene	3.45	8.28		
	X-Methyl Styrene	0.18	0.43		
	Cumene	0.16	0.38		
2*	PM	0.12	0.29		

*Emissions from the Aluminum pour process.

Three Shotblast Machines with shared Baghouse

Goff Shotblast Machine

Aluminum castings produced on the EPS Casting Unit are cleaned of refractory coating and mullite grain by a stream of steel shot set to impinge upon the castings at a high velocity by the blast wheels. The castings are placed on a **rotating hanging fixture** within a closed chamber, which is ventilated by the plant baghouse filter dust collection system, thus collecting mullite grain and refractory material particulate. The casting surface is rendered smooth and uniformly enhanced by the process.

Bronco and DeLong Shotblast Machines

These machines use the same method as the Goff Machine except the castings are placed on a **rubber belt** that rotates in a closed chamber that is ventilated to the plant baghouse filter dust collection system.

The three (3) Shotblast Machines share a common baghouse with the EPS Molding and the Casting Unit and Thermal Reclamation Unit. Emission point “1” is associated with this process.

Applicability:

- These units are subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.
- These units are subject to ADEM Admin. Code r. 335-3-4-.01(1), “*Control of Particulate Emissions – Visible Emissions*”.
- These units are subject to ADEM Admin. Code r. 335-3-4-.04(1), “*Control of Particulate Emissions for Process Industries – General*”.
- The Goff Shotblast Machine has an enforceable limit in order to prevent them from being subject to the provisions of ADEM Admin. Code r. 335-3-14-.04, “*Air Permits Authorizing Construction in Clean Air Areas [Prevention of Significant Deterioration]*”.
- These units are subject to 40 CFR 64, “*Compliance Assurance Monitoring*” (CAM).
- There are no New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAP) applicable to these units.

Emissions Standards:

Opacity

ADEM Admin Code r. 335-4-.01(1)(a)(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty percent (20%) opacity, as determined by a six (6) minute average. During one six (6) minute period a person may discharge into the atmosphere from any source of emission forty percent (40%) opacity.

Particulate Matter

Particulate matter emissions from the Goff Shotblast machine shall not exceed the lesser of the Anit-PSD limit of 15.52 lbs/hr (66.74 TPY) as required by ADEM Admin Code r. 335-3-14-.04, or the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62}$$

(P less than 30 tons per hour)

$$E = 17.31 (P)^{0.16}$$

(P greater than 30 tons per hour)

Where:

E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

Particulate matter emissions from either the Bronco Shotblast machine or the Delong Shotblast machine shall not exceed the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62}$$

(P < 30 tons per hour)

$$E = 17.31 (P)^{0.16}$$

(P ≥ 30 tons per hour)

Where:

E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

CAM Analysis:

The Goff shotblast machine would be subject to CAM given that its pre-controlled emissions exceed 100 TPY total based on 8,760 hours of operation per year. AFC has requested the Goff shotblast machine have a limit on PM emissions of 15.52 lbs/hr. In addition, this unit uses a control device (baghouse) with a 99% removal efficiency. The limit to PM emissions for the Goff shotblast machine in conjunction with the effect of the control device would reduce the total PM emissions for this unit to below the 100 TPY threshold, as defined by §64.1. Therefore, these units would not be required to collect four or more data values as required in §64.3(b)(4)(i).

Refer to the section labeled “Compliance Assurance Monitoring Plan” to see AFC’s monitoring plan to ensure limits are met.

Compliance and Performance Test Methods and Procedures:

Method 5 of 40 CFR 60, Appendix A, Shall be used in the determination of particulate matter emissions. (*Rule 335-3-1-.05*)

Method 5 of 40 CFR 60, Appendix A, Shall be used in the determination of opacity. (*Rule 335-3-1-.05*)

Emission Monitoring:

- The facility shall perform a visual check, once per day, of the stack associated with this unit. This check shall be performed by a person familiar with Method 9. If the instantaneous opacity of emissions in excess of 10% are noted, and are not corrected within a period of 1 hour, then a Method 9 must be performed within 4 hours of the observations. Maintenance shall be performed as needed. Any repairs or observed problems shall be recorded. *(40 CFR Part 64 – CAM)*
- The facility shall monitor and record the baghouse pressure differential daily. Any deviations from the pressure range of 2.0 inches of H₂O to 7.0 inches of H₂O shall be documented along with the corrective action taken and reported to the Department within two (2) working days. *(40 CFR Part 64 – CAM)*
- The facility shall calibrate the pressure gauge annually. If an erratic or abnormal reading is observed then the instrument shall be inspected and either calibrated or replaced. *(40 CFR Part 64 – CAM)*
- The facility shall conduct an annual inspection of the complete baghouse unit. This shall include:
 - Baghouse structure, access doors, door seals, and bags
 - An internal inspection of the baghouse hoppers

(40 CFR Part 64 – CAM)

- The facility shall conduct the following weekly inspections:
 - Check hopper, fan, and cleaning cycle for proper operation
 - Perform a visual check of all hoods and ductwork

(Rule. 335-3-16-.05)

Recordkeeping and Reporting Requirements:

- The facility shall maintain a record of all inspections, to include visible observations and Method 9 observations performed to satisfy the requirements of periodic monitoring. This shall include all problems observed and corrective actions taken. Each record shall be maintained for a period of 5 years. *(Rule 335-3-16-.05(c)(3))*
- If a visible emission observation required using the 40 CFR, Part 60, Appendix A, Method 9, the results should be documented using an ADEM visible emissions observation report and the cause and corrective action taken will be documented in a form suitable for inspection.
- The facility shall maintain daily records the baghouse differential pressure. Each record shall be maintained for a period of 5 years. *(40 CFR Part 64 – CAM)*

Emission Estimates:

Emission estimates for particulate matter (PM) are based on 7,488 run hours of operation per year, castings per hour, and AP-42 Emission Factors from Table 13.2.6-1. Emission limits based on allowable given using process weight equation for those units for which a limit was not requested.

Unit	Potential Emissions		Expected Emissions		Emission Limits	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Goff	6.78	25.40	0.233	1.00	11.76	51.51
Bronco	7.09	26.54	0.11	4.75	12.09	52.95
DeLong	7.09	26.54	0.148	6.35	12.09	52.95

Thermal Reclamation Unit with shared Baghouse

Process Description:

Mullite grain is processed in a 2.1 MMBtu/hr thermal reclamation unit by heating in excess of 1250 °F in an oxidizing atmosphere. The input is mullite grain coated with approximately 0.6% polystyrene acquired by liquefied and condensed foam patterns decomposed by the heat of the molten aluminum poured in the aluminum casting process. Emissions from this unit are styrene monomer, and particulate matter, which are collected in the existing baghouse. The reclaimed mullite is cooled and screened and directly resued in the molding system.

The Thermal Reclamation Unit shares a common baghouse with the EPS Molding and Casting Unit and the three (3) Shotblast Machines. Emission point “1” is associated with this process.

Applicability:

- This source is subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.
- This source is subject to ADEM Admin. Code r. 335-3-4-.01(1), “*Control of Particulate Emissions – Visible Emissions*”.
- This source is subject to ADEM Admin. Code r. 335-3-4-.04(1), “*Control of Particulate Emissions for Process Industries – General*”.
- There are no New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAP) applicable to this process.

Emissions Standards:

Opacity

ADEM Admin Code r. 335-4-.01(1)(a)-(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty percent (20%) opacity, as determined by a six (6) minute average. During one six (6) minute period a person may discharge into the atmosphere from any source of emission forty percent (40%) opacity.

Particulate Matter

Particulate matter emissions from this unit shall not exceed the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62}$$

(P < 30 tons per hour)

$$E = 17.31 (P)^{0.16}$$

(P ≥ 30 tons per hour)

Where:

E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

CAM Analysis:

This source is **not** subject to 40 CFR 64, “*Compliance Assurance Monitoring*”. However, the baghouse that is shared between the Thermal Reclamation Unit, the three shotblast machines, and the EPS Mold and Casting Unit is subject to those requirements set forth in the CAM Plan (see *Compliance Assurance Monitoring section*) based on the potential emissions from the Goff shotblast and EPS Mold and Casting Unit.

Compliance and Performance Test Methods and Procedures:

Method 5 of 40 CFR 60, Appendix A, Shall be used in the determination of particulate matter emissions. (*Rule 335-3-1-.05*)

Method 5 of 40 CFR 60, Appendix A, Shall be used in the determination of opacity. (*Rule 335-3-1-.05*)

Emission Monitoring:

- The facility shall perform a visual check, once per day, of the stack associated with this unit. This check shall be performed by a person familiar with Method 9. If the

instantaneous opacity of emissions in excess of 10% are noted, and are not corrected within a period of 1 hour, then a Method 9 must be performed within 4 hours of the observations. Maintenance shall be performed as needed. Any repairs or observed problems shall be recorded. (*Rule 335-3-16-.05*)

The following emission monitoring requirements are based on the Compliance Assurance Monitoring Plan for the shared baghouse:

- The facility shall monitor and record the baghouse pressure differential daily. Any deviations from the pressure range of 2.0 inches of H₂O to 7.0 inches of H₂O shall be documented along with the corrective action taken and reported to the Department within two (2) working days. (*40 CFR Part 64 – CAM*)
- The facility shall calibrate the pressure gauge annually. If an erratic or abnormal reading is observed then the instrument shall be inspected and either calibrated or replaced. (*40 CFR Part 64 – CAM*)
- The facility shall conduct an annual inspection of the complete baghouse unit. This shall include:
 - Baghouse structure, access doors, door seals, and bags
 - An internal inspection of the baghouse hoppers

(*Rule 335-3-16-.05*) or (*40 CFR Part 64 – CAM*)

- The facility shall conduct the following weekly inspections:
 - Check hopper, fan, and cleaning cycle for proper operation
 - Perform a visual check of all hoods and ductwork

(*Rule 335-3-16-.05*)

Recordkeeping and Reporting Requirements:

- The facility shall maintain a record of all inspections, to include visible observations and Method 9 observations performed to satisfy the requirements of periodic monitoring. This shall include all problems observed and corrective actions taken. Each record shall be maintained for a period of 5 years. (*Rule 335-3-16-.05(c)(3)*)
- If a visible emission observation required using the 40 CFR, Part 60, Appendix A, Method 9, the results should be documented using an ADEM visible emissions observation report and the cause and corrective action taken will be documented in a form suitable for inspection. (*Rule 335-3-16-.05(c)(3)*)

The following recordkeeping and reporting requirements are based on the Compliance Assurance Monitoring Plan for the shared baghouse:

- The facility shall maintain daily records the baghouse differential pressure. Each record shall be maintained for a period of 5 years. (*Rule 335-3-16-.05(c)(3) or (40 CFR Part 64 – CAM)*)

Expected Emissions:

Emission estimates are based on 8,760 hours of operation and an emission factor based on an analytical gravimetric test to determine loss on ignition (LOI) of mullite. Allowable based on process weight equation.

Pollutant	Expected Emissions		Allowable Emissions	
	lb/hr	TPY	lb/hr	TPY
PM	3.59	15.44	5.52	23.72
Styrene	0.021	0.091		
Benzene	0.0104	0.045		
Toluene	0.097	0.419		
Ethyl Benzene	0.288	1.24		
x-Methyl Styrene	0.016	0.07		
Cumene	0.0104	0.045		

Boiler System

Process Description:

The 6.3 MMBtu/hr Cleaver- Brooks Steam Boiler is used in the Polystyrene Bead Pre-expander process. This is a natural gas fired boiler system; therefore, no other fuels will be burned. Note that the Coating Drying Oven, the Pattern Aging Oven, and the Six (6) Space Heaters included in the application are insignificant sources.

Emission Point “3” is associated with this unit.

Applicability:

- This unit is subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.
- This source is subject to ADEM Admin. Code r. 335-3-4-.01(1), “*Control of Particulate Emissions – Visible Emissions*”.
- This source is subject to the applicable requirements of ADEM Admin. Code r. 335-3-4-.03, “*Control of Particulate Emissions – Fuel Burning Equipment*”.

- This source is subject to the applicable requirements of ADEM Admin. Code r. 335-3-5-.01, “*Control of Sulfur Compound Emissions – Fuel Combustion*”.
- This unit is subject to the applicable requirements of 40 CFR 63 Subpart DDDDD, “*National Emissions Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters*,” since AFC is a major source for HAPs and meets the definition of a industrial, commercial, or institutional boiler or process heater as defined in §63.7575.
- This unit is **not** subject to the applicable requirements of 40 CFR 60 Subpart D_c, “*Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*” because the boiler is smaller than the 10 MMBtu/hr threshold.

Emission Standards:

Opacity

ADEM Admin Code r. 335-4-.01(1)(a)-(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty percent (20%) opacity, as determined by a six (6) minute average. During one six (6) minute period a person may discharge into the atmosphere from any source of emission forty percent (40%) opacity.

Particulate Matter

This unit is designed to burn natural gas only; therefore, there are no allowable sulfur dioxide emissions set by ADEM Admin. Code r. 335-3-4-.03, Table 4-1, or 40 CFR 63 Subpart DDDDD.

Particulate matter emissions from this unit shall not exceed the allowable set by ADEM Admin Code r. 335-3-4-.03, Table 4-1. Please note that the emissions from this boiler are expected to be well below the allowable since the only fuel source is natural gas.

Sulfur Dioxide

This unit is designed to burn natural gas only; therefore, there are no allowable sulfur dioxide emissions set by ADEM Admin. Code r. 335-3-5-.01(1)(b) or 40 CFR 63 Subpart DDDDD.

Carbon Monoxide

This unit is not part of a metal production facility or a petroleum process; therefore, there are no allowable carbon monoxide emissions set by ADEM Admin. Code r. 335-3-7. This unit is designed to burn natural gas only; therefore, there are no allowable carbon monoxide emissions set by 40 CFR 63 Subpart DDDDD.

Volatile Organic Compounds

This unit has the potential to emit VOC less than 100 TPY; therefore, there are no allowable volatile organic compound emissions set by ADEM Admin. Code r. 335-3-6-.01(1)(b). This unit is designed to burn natural gas only; therefore, there are no allowable volatile organic compound emissions set by 40 CFR 63 Subpart DDDDD.

Nitrous Oxide

The rated heat capacity of this unit is less than 250 TPY; therefore, there are no allowable nitrous oxide emissions set by ADEM Admin. Code r. 335-3-8-.14. This unit is designed to burn natural gas only; therefore, there are no allowable nitrous oxide emissions set by 40 CFR 63 Subpart DDDDD.

CAM Analysis:

This source is **not** subject to 40 CFR 64, “*Compliance Assurance Monitoring*” given that there is no pollution control device for this unit.

Compliance and Performance Test Methods and Procedures:

Method 5 of 40 CFR 60, Appendix A, Shall be used in the determination of particulate matter emissions. (*Rule 335-3-1-.05*)

Method 5 of 40 CFR 60, Appendix A, Shall be used in the determination of opacity. (*Rule 335-3-1-.05*)

Method 6 of 40 CFR 60, Appendix A, Shall be used in the determination of sulfur dioxide emissions. (*Rule 335-3-1-.05*)

Emission Monitoring Requirements:

- The facility shall perform a visual check, once per day, of the stack associated with this unit. This check shall be performed by a person familiar with Method 9. If the instantaneous opacity of emissions in excess of 10% are noted, and are not corrected within a period of 1 hour, then a Method 9 must be performed within 4 hours of the observations. Maintenance shall be performed as needed. Any repairs or observed problems shall be recorded. (*Rule 335-3-16-.05*)
- The facility shall complete a tune-up every 2 years for this boiler system. (*40 CFR Part 63 Subpart DDDDD, §63.7540*)
- The facility must conduct a one-time energy assessment of existing boilers (constructed before June 4, 2010) performed by a qualified energy assessor, based on paragraph (4) of the definition of energy assessment in §63.7575. The energy

assessment shall be conducted within the allotted on-site technical labor hours per §63.7575 and include the following:

- A visual inspection of the boiler or process heater system.
- An evaluation of operating characteristics of the boiler or process heater systems, specifications of energy using systems, operating and maintenance procedures, and unusual operating constraints.
- An inventory of major energy use systems consuming energy from affected boilers and process heaters and which are under the control of the boiler/process heater owner/operator.
- A review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage.
- A review of the facility's energy management practices and provide recommendations for improvements consistent with the definition of energy management practices, if identified.
- A list of cost-effective energy conservation measures that are within the facility's control.
- A list of the energy savings potential of the energy conservation measure identified.
- A comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments.

(40 CFR Part 63 Subpart DDDDD, Table 3)

(American Foam Cast Performed the facility Energy Assessment in January 2016)

Recordkeeping and Reporting Requirements:

- The Permittee must submit a biennial compliance report. *(40 CFR Part 63 Subpart DDDDD, §63.7550(b))*
- The facility shall maintain a record of all inspections, to include visible observations and Method 9 observations performed to satisfy the requirements of periodic monitoring. This shall include all problems observed and corrective actions taken. Each record shall be maintained for a period of 5 years. *(Rule 335-3-16-.05(c)(3))*
- The facility must maintain a record of all biennial tune-ups available on request. Each record shall be maintained for a period of 5 years. These records shall contain the following information: *(40 CFR Part 63, §63.7540(a)(10)(vi))*
 - (a) The concentrations of CO in the effluent stream in parts per million by volume, and the oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the boiler or process heater.

- (b) A description of any corrective actions taken as a part of the tune-up.
- If a visible emission observation required using the 40 CFR, Part 60, Appendix A, Method 9, the results should be documented using an ADEM visible emissions observation report and the cause and corrective action taken will be documented in a form suitable for inspection. (*Rule 335-3-16-.05(c)(3)*)
 - If the facility intends to use a fuel other than natural gas to fire this boiler unit during a period of natural gas curtailment or supply interruption, as defined in §63.7575, you must submit a notification of alternative fuel use within 48 hours of the declaration of each period of natural gas curtailment or supply interruption. (*40 CFR Part 63, §63.7545(f)*)

Expected Emissions:

Emission estimates are based on 8,760 hours of operation and AP-42 Emission Factors, Tables 1.4-1 and 1.4-2.

Pollutant	Expected Emission	
	lbs/hr	TPY
CO	0.519	2.23
NO _x	0.618	2.66
PM	0.047	0.202
SO ₂	0.003	0.016
VOC	0.034	0.146

Compliance Assurance Monitoring Plan

The Compliance Assurance Monitoring Plan applies to the EPS Molding and Casting Unit and the three (3) shotblast machines. Based on these unit’s allowable emission standards they would exceed the 100 TPY threshold for particulate matter. Therefore, in addition to installing a control device AFC requested the following limits:

1. EPS Molding and Casting Unit shall not operate more than 4,800 hours in any consecutive twelve month period.
2. Goff shotblast machine shall limit PM emissions to no more than 15.52 lbs/hr.

These limits prevent the facility from being required to collect four or more data values as required in §64.3(b)(4)(i).

To satisfy the requirements of CAM the facility proposes the following monitoring plan:

I. Indicator	Differential Pressure	Visible Emission
II. Measurement Approach	Measured using a Magnehelic Differential Pressure Gauge	Visual inspection of the baghouse stack
III. Indicator Range	While the unit is operation, an excursion is defined as a pressure differential below 2.0 inches of H ₂ O or greater than 7.0 inches of H ₂ O. Excursions trigger an inspection, corrective action, and a reporting requirement.	Baghouse stack visual emission opacity should be less than 5%. Excursions of opacity shall not exceed 10% for more than 4 hrs. Excursions trigger an inspection, corrective action, and a reporting requirement. If an excursion is noted and not corrected within a period of one hour, then a method 9 must be performed with four hours of the observation.
IV. Performance Criteria		
Data Representativeness	The pressure gauge measures the pressure differential between the inlet and outlet of the baghouse.	Baghouse shell is visually inspected for deterioration. If needed, it is repaired or replaced. Broken or leaking filter bags are replaced.
Verification of Operation Status	Not applicable	Not applicable
QA/QC Practices and Criteria	The pressure gauge shall be calibrated annually. If abnormal pressure is found, the gauge shall be inspected and corrected or replaced.	Opacity readings shall be taken by a person fully trained and qualified according to EPA standards. Gauge calibration shall be conducted when erratic reading are displayed, or at least annually.
Monitoring Frequency	The pressure differential shall be monitored and logged daily.	The complete Baghouse Unit shall be inspected at least annually. The visual emission shall be performed daily.

Data Collection Procedures	The pressure differential will be recorded with the time, date, and name of the observer.	A record of the results of the Baghouse inspection shall be kept with the time, date, bags condition and number replaced.
Averaging Period	Instantaneous	Instantaneous

Justification

Rationale for Selection of Performance Indicators

- Visible emissions were selected as a performance indicator because it is indicative of good operation and maintenance of the fabric filter. When the equipment is properly operating, visible emissions will maintain a consistently normal appearance. If the exhaust plume should change in overall appearance, there is a likelihood that the fabric filter may have entered into an upset condition that must be investigated to determine the cause of the abnormal emission. The most likely causes of increased visible emissions from a fabric filter is broken bags or condensation of high moisture content exhaust air.
- In general, the fabric filter will operate within a prescribed range of pressure drops based on the airflow being delivered to the equipment. If the pressure drop readings change dramatically or fall outside of the specified range, an investigation must be performed to determine the cause of the change in readings and remedial actions performed, if required. The most likely causes of a change in pressure drop are either broken or blinded filter bags, clogged inlet lines, or a significant reduction in airflow to the collector.
- Proper maintenance of the auxiliary equipment is essential to proper operation of the baghouse. Therefore, AFC will conduct weekly inspections of the hopper, fan, cleaning cycle, hoods, and ductwork. Additionally, AFC will complete an internal inspection of all structures, access doors, bags, and hoppers once per twelve month period.

Rationale for Selection of Indicator Ranges

- The selected indicator for visible emissions is a change from normal appearance. The observer will be trained to recognize normal emissions from the exhaust so that in the event there is a change in appearance of the exhaust plume; an investigation into its cause can be initiated. Some visible emissions are detected at the exhaust monovent due to the presence of some particulate not captured on the fabric filter (fabric filter removal efficiency is estimated at 99%). This is considered a normal condition. If a consistent change in the color, consistency, or other appearance feature of the plume is noted, it will be documented as an excursion. When an abnormal condition exists, maintenance will be notified of the excursion, and will instigate an investigation to determine the cause of the visible emission. Once

determined, the cause of the excursion will be documented and any necessary maintenance activities required to correct the visible emissions will be scheduled and performed at a time such that the impact to operations are minimized while insuring that no emissions limits are violated. All results of the investigation and any maintenance activity associated with the correction will be documented. No formal report will be required unless it is determined that an emission limit has been exceeded.

- The selected indicator for the fabric filter unit is a pressure drop less than 2.0 inches of H₂O or greater than 7.0 inches of H₂O. Whenever the pressure drop is above or below the range of 2 to 7 inches of H₂O an investigation into its cause will be initiated. The wide range of values is required because of the variability in airflow to the fabric filter unit. Low production will lead to low airflow with high production yielding a corresponding high airflow. If the pressure drop reading has fallen outside of the range, maintenance staff will be notified of the excursion, and will instigate an investigation to determine the cause of the unusual reading. Once determined, the cause of the excursion will be documented and any necessary maintenance activities required to correct the unusual pressure drop will be scheduled and performed. The activities will occur at a time such that the impacts to operations are minimized, while insuring that no emissions limits are violated. All results of the investigation and any maintenance activity associated with the correction will be documented. No formal report will be required unless it is determined that an emission limitation has been exceeded.

Recommendation:

Based on the above analysis, I recommend that, pending the 30-day public comment period and 45-day EPA review period, American Foam Cast, Inc. be issued a renewal for Major Source Operating Permit No. 309-0047. The facility should be able to meet the requirements of this permit and all applicable state and federal air pollution regulations.

Paul J. Vaccaro
Industrial Minerals Section
Energy Branch
Air Division

July 13, 2020

Date